

PATENT SPECIFICATION

941,028

DRAWINGS ATTACHED.

941,028



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COMPLETE SPECIFICATION.

Improvements in or relating to Suspension Arrangements for Suspended Ceilings.

I, MILTON OSWALD HEMMING, a British Subject and New Zealand Citizen, of 25A Campbell Road, Onehunga, Auckland, in the Dominion of New Zealand, do hereby
5 declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to suspension arrangements for suspended ceilings.

Suspended ceilings are generally retained at the desired height from a superstructure by means of a framework to which tiles or
15 the like are attached, this framework being suspended from the superstructure by hangers which, in a simple form, may be a heavy wire or a screwed rod and of which there are many variations. However, all
20 the previously known forms of hangers are awkward to use and require much time in their fixing.

It is an object of this invention to provide an improved suspension arrangement for
25 supporting a suspended ceiling framework from the superstructure.

With this object in view, the present invention provides a suspension arrangement,
30 for a suspended ceiling, comprising a suspension bracket for supporting a ceiling framework and having a hanger slot therein, a strap adjustably retained in said slot, and securing means enabling said strap to be
35 secured to a superstructure so that the suspension bracket is suspended therefrom by the strap.

The invention will be described further, by way of example, with reference to the
40 accompanying drawings in which:—

Fig. 1 is a part-sectional elevation showing the suspension strap and securing means

thereof, of one embodiment of the suspension arrangement of the invention, the securing means being shown in position in a
45 superstructure;

Fig. 2 is a plan view showing a portion of the strap of the arrangement of Fig. 1;

Fig. 3 is a plan view showing a modified form of the strap;

Fig. 4 is a side elevation of the strap of
50 Fig. 3;

Fig. 5 is a fragmentary perspective view of a suspension bracket which may be used with the strap of Figs. 1 and 2 or of Figs. 3
55 and 4;

Fig. 6 is a further view of the bracket of Fig. 5, but showing the strap of Figs. 1 and 2 engaged therewith;

Fig. 7 is a perspective view of the suspension bracket of Figs. 5 and 6, showing the strap of Figs. 1 and 2 engaged therewith,
60 and showing also a main suspension runner;

Fig. 8 is a view similar to Fig. 7, but showing an alternative form of suspension bracket and main suspension runner;

Fig. 9 is a view similar to Fig. 6, but showing a further modified form of suspension bracket; and

Fig. 10 is a view similar to Fig. 6, but showing an alternative way of fixing the
70 strap to the superstructure.

Referring to Figs. 1 and 2 of the drawings, the suspension strap (indicated by the reference numeral 11) is formed from a strip of
75 suitable material such as a lightweight metal.

A series of transverse slots 13 are formed at intervals along each longitudinal edge of the strap 11, these slots 13 being staggered on opposite sides of the strap 11 as will be
80 seen more particularly from Fig. 2, the slots 13 also preferably each extending from the respective edge of the strap 11 at a slanting

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angle relative to the respective edge, which angle may be varied as desired. The strap 11 is provided with securing means whereby it can be fixed to a superstructure 16 and such securing means may take various forms. One form thereof is illustrated in Fig. 1 in which the strap is shown as having been inserted into a cavity box 14 embedded in the superstructure 16 and bent around a stirrup 15 anchored in the said superstructure 16, the stirrup 15 passing through the cavity box 14 to form an eye as shown in the figure to receive the strap.

One form of suspension bracket with which the strap 11 of Figs. 1 and 2 is employed is indicated by the reference numeral 17 in Figs. 5 and 6. This bracket 17 is of channel section so as to have two side walls or flanges 18 with a central horizontal portion 19. A closed hanger slot 24 is formed in the horizontal portion 19 of the bracket, the entry to this slot having a gap 25 on one side thereof and an upstanding tongue 26 on the other side, the tongue 26 being complementary in size to the gap 25 as will be seen from Fig. 6.

In assembling the bracket 17 on the strap 11, the strap 11 is entered into the hanger slot 24 through the gap 25 and is moved along the said slot 24 until one transverse slot 13 of the strap 11 engages over the blind end of the hanger slot 24. Thereupon the tongue 26 is bent to lie in the gap 25 as indicated in Fig. 6 thereby retaining the strap 11 within the hanger slot 24. In this position of the tongue 26, the strap 11 will be retained in the slot 24 and locked to the bracket 17 by reason of the slot 13 of the strap 11 engaging over the blind end of the hanger slot 24.

The transverse slots 13 on one side of the strap 11 are preferably staggered in relation to those on the other side, as shown in Fig. 2, to give a fine adjustment of height between the superstructure and the bracket 17, so that if a transverse slot 13 on one side of the strap 11 does not give the required height, then the whole strap 11 may be turned through 180° to present a slot 13 on the other side thereof to the blind end of the slot 24. If a finer graduation in distance is still required, the strap 11 may be given a twist as indicated at 27 in Fig. 10, which will shorten the effective length of the strap 11 by a small amount.

Fig. 7 illustrates one method of employing the basic bracket which was described as for Figs. 5 and 6 in a suspended ceiling. The bracket has the hanger slot 24 to receive the strap 11 and the gap 25 and tongue 26 to retain the strap 11. One side wall 18a is extended as shown and is provided with a plurality of pressed-out protrusions 30, which may conveniently be formed by stamping, with their ends 31 bent inwards by a small

amount. The main suspension member 32 shown in Fig. 7, which member 32 may be of extruded metal and is of a general inverted-T-section, has a longitudinal enlargement 33 formed on the upstanding flange 34 thereof, this enlargement 33 providing a shoulder 35 with a groove 36 into which the ends 31 of the protrusions 30 of the bracket may enter. The lower longitudinal edge 37 of the bracket is slightly kinked as indicated, so that it may engage into a corresponding groove 38 formed in the horizontal flange of the suspension member 32. It will thus be seen that the bracket may be pushed over the enlargement 33 of the main suspension member 32 and the lower longitudinal edge 37 will enter into the groove 38 so that the protrusions 30 will spring against the upstanding flange 34 with the ends 31 of such protrusions engaging into or under the grooves 36 of the enlargement 33. The bracket will then be firmly locked onto the main suspension member 32 but may be moved longitudinally along such member 32 should it be necessary for correct positioning thereof.

Fig. 8 indicates a further form of bracket which is applicable to a double inverted-T-section main suspension member 40. This bracket has the slot 24, gap 25 and tongue 26 and also protrusions 30. The bracket also has fingers 41 which engage over the respective outsides of the two upstanding flanges 34 of the main suspension member so that when the bracket is engaged on the main suspension member it will be rigidly held from transverse movement.

Fig. 9 indicates an alternative form of suspension bracket employing a closed hanger slot 43 which is preferably slightly longer than the width of the suspension strap 11. As will be seen from the figure, the strap 11 is entered into the slot 43 and is moved sideways so that a slot 13 of the strap 11 engages over one end wall of the hanger slot 43. The end of the strap 11 is then bent as at 44 around the edge of flange 45 of the bracket to lock the two securely together.

In Fig. 10 is shown another securing means fixing the strap 11 to a superstructure, which means may, for instance, be by a bolt 46 shot into the superstructure by a bolt-firing gun. The strap 11 can, of course, be attached to the superstructure by any other suitable means.

Figs. 3 and 4 illustrate a modification of the strap 11 wherein a plurality of pawls or teeth 47 are formed in the strap 11 for instance by stamping or pressing. As will be seen from Fig. 4, alternate teeth 47 project on opposite sides of the strap 11 so that either end of the strap 11 may be attached to the superstructure. This strap may be inserted into a hanger slot 24 in a suspension bracket in the manner described above

for the slotted strap 11, so that a tooth 47 of such strap engages under the wall of the said slot.

WHAT I CLAIM IS:—

5 1. A suspension arrangement, for a suspended ceiling, comprising a suspension bracket for supporting a ceiling framework and having a hanger slot therein, a strap adjustably retained in said slot, and securing means enabling said strap to be secured to a superstructure so that the suspension bracket is suspended therefrom by the strap.

10 2. A suspension arrangement as claimed in Claim 1 wherein the strap is formed with a plurality of spaced-apart slots for engaging the suspension bracket, the slots each extending inwardly from a longitudinal edge of the strap.

15 3. A suspension arrangement as claimed in Claim 2 wherein the slots in the strap are provided along both longitudinal edges thereof.

20 4. A suspension arrangement as claimed in Claim 3 wherein the slots along one longitudinal edge of the strap are staggered in relation to the slots in the other longitudinal edge of the strap.

25 5. A suspension arrangement as claimed in Claim 2, 3 or 4 wherein the slots each extend inwardly, from the respective longitudinal edge of the strap, at a slanting angle relative to such edge.

30 6. A suspension arrangement as claimed in Claim 1 wherein the strap is formed with a plurality of protruding teeth, for engagement with the suspension bracket, said teeth being spaced longitudinally of the strap.

35 7. A suspension arrangement as claimed in Claim 6 wherein the alternate teeth protrude on opposite sides of the strap.

40 8. A suspension arrangement as claimed in any preceding claim wherein the suspension bracket has a horizontal portion in which the hanger slot is formed.

45 9. A suspension arrangement as claimed in Claim 8 wherein a tongue is provided at the entry to the hanger slot and is capable of being folded down to a position blocking the slot.

50 10. A suspension arrangement as claimed in Claim 9 wherein the suspension bracket has a gap formed in its horizontal portion and disposed so that the tongue can be folded to lie therein.

55 11. A suspension arrangement as claimed

in any preceding claim wherein the suspension bracket is in the form of a member having at least one upright portion and one horizontal portion.

12. A suspension arrangement as claimed in Claim 11 wherein the end of the strap which protrudes through the hanger slot of the suspension bracket is bent around the edge of the horizontal portion of the bracket.

13. A suspension arrangement as claimed in Claim 12 and any of Claims 1 to 8 wherein the hanger slot is a closed slot.

14. A suspended ceiling comprising main suspension members each supported from a plurality of suspension arrangements, as claimed in any preceding claim, by engagement with the suspension brackets thereof.

15. A suspended ceiling as claimed in Claim 14 wherein each main suspension member is of inverted-T-section, a shoulder on the vertical flange thereof engaging a protrusion on an upright portion of the suspension bracket.

16. A suspended ceiling as claimed in Claim 14 wherein each main suspension member is of inverted double-T-section, a shoulder on one of the vertical flanges thereof engaging a protrusion on an upright portion of the suspension bracket.

17. A suspended ceiling as claimed in Claim 14, 15 or 16 wherein the securing means for each strap comprises a bolt passing through the strap and secured into a superstructure above the suspended ceiling.

18. A suspended ceiling as claimed in Claim 14, 15 or 16 wherein the securing means for each strap comprises a member which is secured to a superstructure above the suspended ceiling and around which the strap is bent.

19. A suspended ceiling as claimed in Claim 18 wherein the said member is recessed into the superstructure.

20. A suspension arrangement, for a suspended ceiling, substantially as hereinbefore described with reference to and as illustrated in the various figures of the accompanying drawings.

For the Applicant,
BARLOW, GILLET & PERCIVAL,
Chartered Patent Agents,
94 Market Street, Manchester 1,
and
93 Chancery Lane, London, W.C.2.

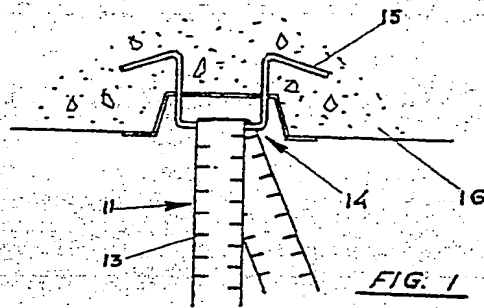


FIG. 1

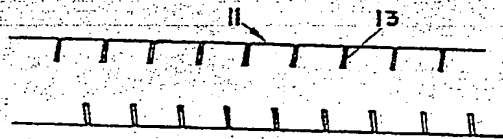


FIG. 2

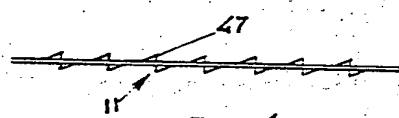


FIG. 4

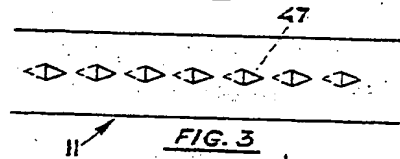


FIG. 3

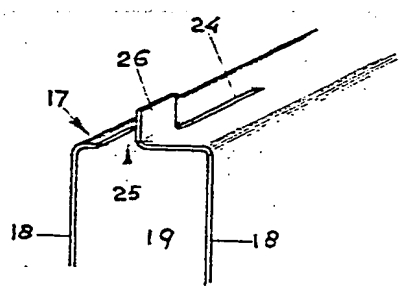


FIG. 5

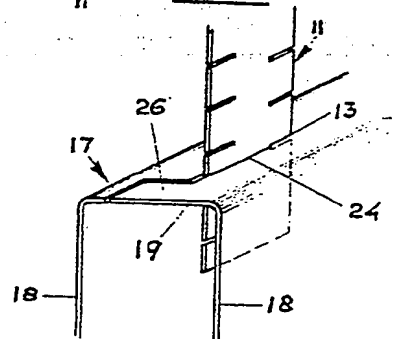


FIG. 6

11-
24-
25-
26-
31-
33-
36-
37-
34-

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45-
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COMPLETE SPECIFICATION

2 SHEETS

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the Original on a reduced scale
Sheets 1 & 2

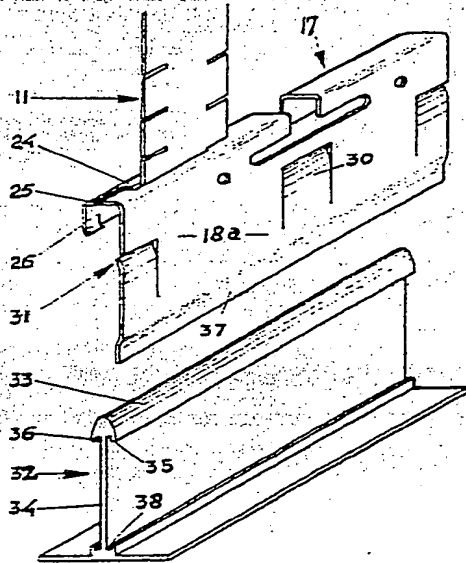


FIG. 7

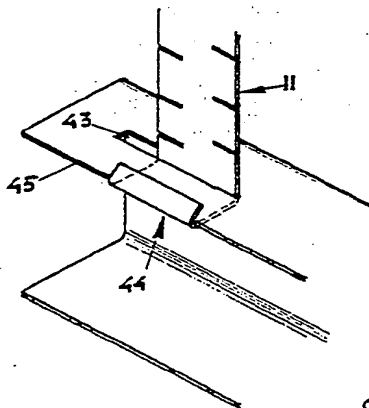


FIG. 9

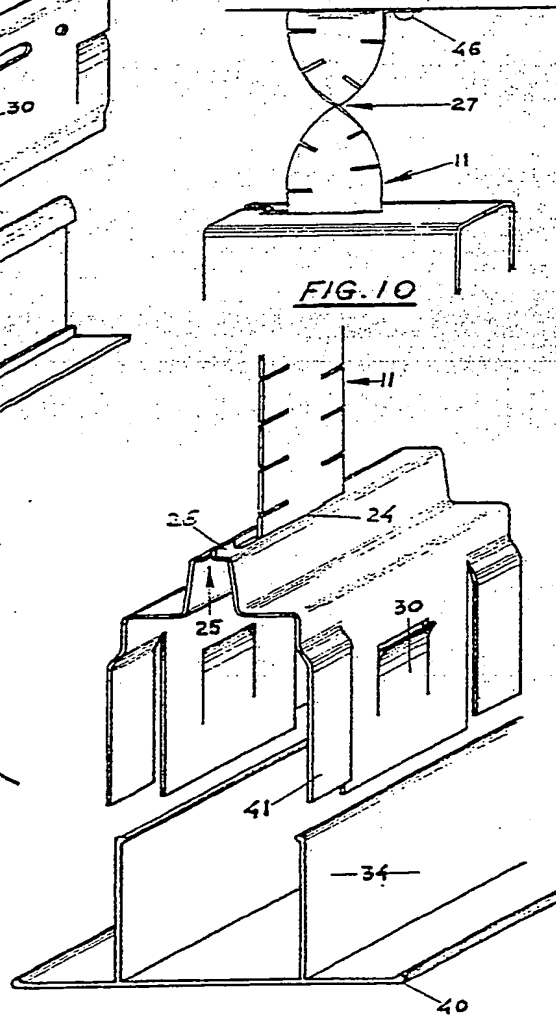


FIG. 8

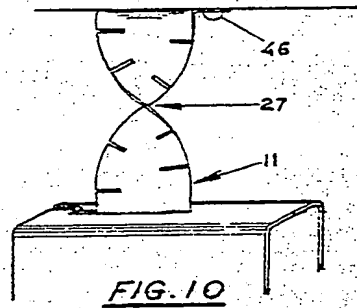


FIG. 10

541028 COMPLETE SPECIFICATION
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 Sheets 1 & 2

